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WO 03/107375 A2

(54) Title: A PARTICLE BEAM GENERATOR

(57) Abstract: The source of electrons is a nanotip in a vacuum as used in near field microscopy. The source of ions is a similar nanotip in vacuum supplied with liquid metal (gallium) as in a liquid-metal ion source. Electrons or ions from this nanometre-sized tip are extracted by centralising the tip over an aperture plate and applying a suitable voltage to the tip. The electrons (ions) pass through this plate and are accelerated up to several keV using a nanoscale/microscale accelerating column before being focussed using further microscale (or nanoscale) cylindrical lenses. The final element is an aberration corrected miniature (or sub-miniature) einzel lens which can focus the beam at several millimetres from the end of the instrument.

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